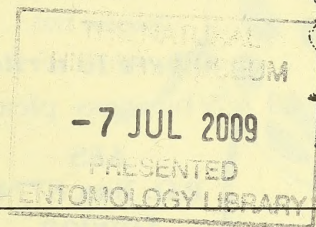
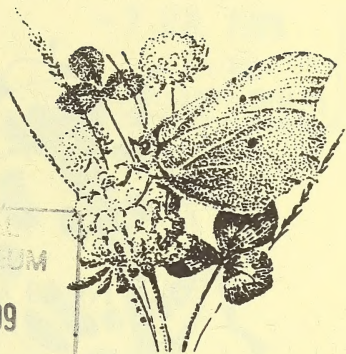


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Invertebrate Conservation News



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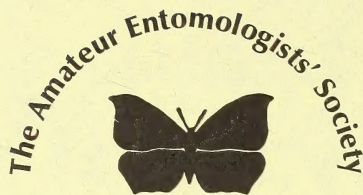
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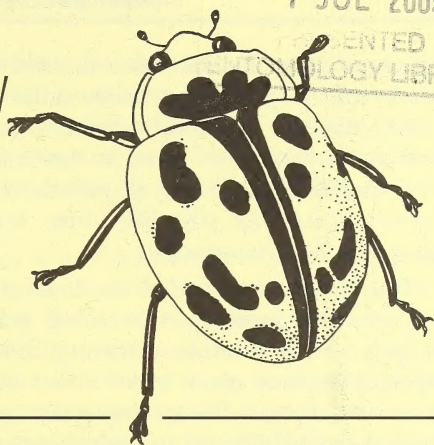
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INVERTEBRATE CONSERVATION NEWS



No. 59, June 2009

EDITORIAL

Successive analyses of long-term monitoring data have indicated that various invertebrates have become less abundant over recent decades in the UK and elsewhere. As mentioned briefly in the editorial of *ICN* 51, some of the earlier analyses showed alarming declines in bees, hoverflies and moths. More recently in the UK, we experienced two rather dull summers (2007 and 2008), which helped to reinforce the view of many amateur entomologists that insects have generally become less abundant; probably even less so than could be expected just because of poor weather.

A general indication of the abundance of invertebrates can be gleaned from the results of bird monitoring. This is possible because invertebrate prey is essential for many birds, including various seed-eating species whose chicks require protein-rich food. A UK government website includes the following statement (Anon, 2008): "*Bird populations are considered to be a good indicator of the broad state of wildlife and the countryside because they occupy a wide range of habitats and they tend to be near to or at the top of the food chain. This means that, as a rule, healthy bird populations signify a healthy state of the plants and invertebrates on which they feed.*" This statement is justified to some extent, since a large population of birds depends on an abundant source of invertebrates. On the other hand, the range of invertebrate species does not need to be very diverse.

In the UK, recent decades have brought a marked decline in various birds of farmland and of urban gardens. This well-publicised trend has been attributed partly to a presumed decline in the populations of invertebrate prey species. Quite a lot is said in public about the



importance of invertebrates as bird-fodder, but far less is said about their role in providing many other essential 'ecological services', or about the fact that they represent an immensely greater proportion of the fauna than birds. It is, however, helpful that many people assist in the monitoring of bird populations, since analyses of the resulting information can provide clues about the conservation status of invertebrate prey species.

The greatest recorded decline of farmland birds in England has occurred amongst species classed as specialists, some of which depend largely on invertebrates throughout life. The data for different bird species provide some clues about the impacts of agricultural changes on invertebrates. For example, Defra, the UK government department with responsibility for the environment and countryside, points out that the lapwing *Vanellus vanellus* requires open areas for nesting and grassland, rich in invertebrate prey (Anon, 2008). The suggestion is that its decline has probably been due to an increased autumn sowing of crops, an intensification of grassland management and a decline in mixed farming.

There is of course some movement of birds between gardens and farmland, as in the case of the greenfinch *Carduelis chloris*, which increased in abundance between the 1980s and 2005, perhaps because of feeding in gardens (Anon, 2008). Since feeding is thought to boost the populations of various bird species, their size might fail to reflect the abundance of wild invertebrate prey. On the other hand, as mentioned below in our *Research Notes* section, studies on the House sparrow *Passer domesticus* have indicated that feeding does not necessarily compensate for a lack of invertebrates.

Apart from the questions that remain unanswered when birds (with or without artificial feeding) are used as indicators of invertebrate abundance, there is cause for concern that artificially boosted bird populations could be preying unsustainably on invertebrates. The sheer number of individual invertebrates involved (e.g. an estimated 20,000 caterpillars to raise one clutch of blue-tits *Parus caeruleus*) is at least a basis for justifying some research on the potentially adverse effects of bird feeding (perhaps with financial support from suppliers of bird food!).

If the potential effects of bird feeding on invertebrate populations are not investigated, any concern must remain based on the precautionary principle and on anecdotal information, rather than on hard evidence. Perhaps, however, a certain amount of information could be gathered by appraising the existing results of related studies. One such study in



Germany involved the use of experimental plots of wheat and oats in order to assess the effects of insect predation by the Tree sparrow *Passer montanus*. When the birds were allowed to enter the plots, they preferentially fed on the natural enemies of cereal aphids, so that the aphid population rose above an economic threshold (Lehmann *et al.*, 2005).

Funding for the direct monitoring of invertebrates tends to be limited to certain taxa or habitats of special economic or popular interest. Economically-driven studies involve pollinators, various pest species and, in some cases, their natural enemies. Also, various other invertebrate species are monitored in the context of game rearing, with a view to improving habitats for invertebrate prey. With popularity as a stimulus, some of the more showy species – especially the larger Lepidoptera – have been monitored for many years in Britain. The main schemes for Lepidoptera in Britain are the UK Butterfly Monitoring Scheme, set up in 1976 by the organisation now known as the Centre for Ecology and Hydrology, and the Rothamsted Insect Survey (set up in 1965 within the context of economic entomology), in which macro-moths are recorded in light-traps.

Lepidoptera are often regarded as good indicators of biodiversity, since the various species depend on a wide range of plant species in favourable conditions. The available information on butterflies and macro-moths shows that many species have declined greatly in abundance (Conrad *et al.* 2004; Fox *et al.*, 2007). Some of these have also been showing retractions in their geographical distributions; perhaps after undergoing a previously undetected decline in abundance. It is evident that species can be serious decline, even if their plight is not currently shown by their simple presence or absence on distribution maps.

Conclusions about the changing abundance of Lepidoptera can be reached because the species concerned have been monitored long enough to show trends over and above the large fluctuations that tend to occur from year to year. For other invertebrate taxa that do not show such extreme fluctuations, any strong trends could probably be revealed within a shorter timescale, but most such taxa are not popular enough to attract many volunteers or sponsors. The few exceptions include dragonflies and bumblebees, which have been monitored to some extent.

On the assumption that Lepidoptera can be used as indicators for other invertebrates that occur in similar habitats, there is serious cause for concern. There is, however, no substitute for the direct monitoring



of a wider range of invertebrates. Such monitoring would be particularly valuable for taxa that depend on various habitats (e.g. saproxylic and aquatic ones) for which Lepidoptera have little value as indicators.

Other evidence for a decline in invertebrate populations is mainly anecdotal, but in 2004 there was a potential starting point for a rough and ready system of monitoring. This was the "Big Bug Count", a survey organised by the Royal Society for the Protection of Birds, in which volunteers counted the remains of insects splattered on their car number plates during journeys made within different parts of Britain. The exercise has been conducted only once so far and cannot yet show any trends, but there were suggestions that fewer insects were counted than might have been anticipated.

In the Big Bug Count, the motor car was employed as a potentially useful sampling tool but its involvement brings to mind the worrying fact that invertebrates (not only airborne insects) are killed in vast numbers on roads. Thus, when we look for possible factors in the suspected decline in invertebrate abundance, 'road kill' should not be forgotten. There have been few studies of its effects on invertebrate abundance or diversity, but any such effects are presumably growing with the increased building, widening and usage of roads. Pollution from motor vehicles could also be harming invertebrates. As some writers have suggested, such pollution has not necessarily increased, but it has changed in its character due to the use of methyl tertiary-butyl ether (MTBE) as an additive to lead-free petrol.

Perhaps the main suspect is agricultural intensification, which has generally tended to reduce opportunities for invertebrates to thrive in and around crops. There is particular concern about the increased sowing of cereals in the autumn, whereby habitats and refugia associated with stubble or other crop residues are not allowed to persist until the following spring. There is also concern that pesticides are having a greater impact on invertebrates than in earlier decades, although this might seem hard to believe when we consider that persistent, unselective substances such as DDT were formerly in use. It has, however, been suggested that certain pesticides are having sub-lethal effects on invertebrates, such as a reduction in their fecundity. Also, herbicides exert a major indirect effect, by destroying a wide range of invertebrate foodplants.

The available information on the declining abundance of certain vertebrates and invertebrates is clearly of concern, but much of it is indirect or too restricted in its taxonomic and ecological scope. There



is clearly a need for more resources to be directed towards the monitoring of a representative range of invertebrates with their conservation in mind.

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NEWS, VIEWS AND GENERAL INFORMATION

£10 million initiative to tackle bee and pollinator decline in the UK

According to a UK government press release on 21st April 2009, up to £10 million is to be invested to help identify the main threats to bees and other insect pollinators. This commitment has been made in response to evidence that these insects have been increasingly affected by a variety of diseases and environmental threats over the last five to ten years. Populations of bees are said to have fallen by 10 and 15 per cent over the last two years. The environmental factors are thought to include the occurrence of warmer winters and wetter summers. (Information about bee health in the UK can be found in the following website: www.defra.gov.uk/hort/bees/)

The funds will be made available to research teams across the UK under the 'Living With Environmental Change' (LWEC) partnership. This is a joint initiative from the Biotechnology and Biological Sciences Research Council (BBSRC), Defra (the UK government department with responsibility for the environment and countryside), the Natural Environment Research Council (NERC), the Wellcome Trust and the Scottish Government.



SITES AND SPECIES OF INTEREST

Correction regarding the Crucifix ground beetle

The reported rediscovery in 2008 of the Crucifix ground beetle *Panagaeus cruxmajor* at Wicken Fen, one of its former strongholds in eastern England, was mentioned in ICN No. 57. Unfortunately the identification was erroneous, as reported in a recently published apology (Warrington, 2009). This means that the beetle is currently known only at three sites in the UK; in Yorkshire, Lincolnshire and Sussex. The Sussex population is small and was recently discovered in flood detritus along the River Rother. A fourth population in Wales was recently lost due to marine incursion of a dune system but there are hopes that the beetle might still be present in nearby areas of suitable habitat. Several records have been made also in Galway in Ireland.

The beetle, which has distinctive bright red markings on a black background, used to occur more widely in marshes and fens in the southern half of Britain but has been declining for many years. Current factors causing loss or decline include a lack of grazing on wet pasture or dune slacks, leading to growth of scrub or coarse grassland.

Reference

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Dungeness, Kent: plans for a new nuclear power station

Dungeness, near the south-east corner of England, is the largest shingle foreland in Britain (and also, it is said, in Europe). It is noted for its invertebrate fauna, which is unique within the UK, and serves as a natural entry point for natural colonisation of Britain by continental species. Owing to the very high biological interest of Dungeness, a Special Area of Conservation (SAC) has been designated there. It is, however, also the site of a nuclear power station (Dungeness B) and is now being considered for the construction of a further power station (Dungeness C). An earlier station (Dungeness A) is being decommissioned.

Buglife – The Invertebrate Conservation Trust has responded to a public consultation, expressing concern about the habitat damage that is likely to occur if the plan goes ahead. Buglife is concerned about the overall reduction in the area of floristically rich shingle, which is currently large enough to support the UK's greatest concentration of



bumblebee species, most of which have declined severely elsewhere. Buglife warns that some of these species could suffer the fate of *Bombus subterraneus*, which had its last stronghold at Dungeness before becoming nationally extinct. Buglife also points out that certain invertebrates are very localised within the shingles probably because they have exacting requirements which occur within a mosaic of habitats; these include the legally protected Sussex Emerald moth *Thalera fimbriatus*.

Apart from the direct effects of the proposed 'land take', the remaining habitats could be affected by activities such as water abstraction, which could allow alter the balance between saline and freshwater zones. Also, Buglife is concerned that air pollution from the proposed construction work could harm lichens which are essential for rare moths, such as the Pygmy Footman *Eilema pygmaeola* and the Marbled Green *Cryphia muralis*.

The 2012 Olympic Games: invertebrates in the Lea Valley, east London

The River Lea (or Lee) is one of the main tributaries of the Thames, flowing southwards into east London. The importance of wildlife in the Lea Valley was highlighted in the early 1970s, when local campaigners tried to secure recognition for the habitat value of Walthamstow Marshes, which lies north of the current Olympic development. As reported in early issues of the forerunner of *ICN* (the Bulletin of the AES Conservation Group), the campaigners, including AES member Brian Wurzell, encountered major official hurdles in trying to secure any formal designation for the protection of flora and fauna. Nowadays, under the auspices of the Greater London Authority, the lower Lea Valley is designated as a Site of Metropolitan Importance for nature conservation. Walthamstow Marshes remain largely free from major developments, but various facilities for formal recreation have been constructed in recent decades along the lower Lea Valley.

Before the venue for the 2012 was decided, naturalists in north-east London were concerned to learn that the lower Lea Valley had been selected for the construction of the Olympic Park and for housing development in the longer term. By 2005, when London won the bid, the authorities had acknowledged that wildlife habitats existed in areas that they had previously dismissed as being occupied by industrial dereliction. By January 2007, the Olympic Delivery Authority (ODA)



had published a Sustainable Development Strategy, which included some provision for wildlife. More specifically, there have been various announcements of habitat creation schemes, but there have also been continuing criticisms from naturalists. It might therefore be interesting to look at the messages that have been promulgated on both sides of the debate.

By March 2006, concern was being expressed not only about the loss of habitats that would result from the Olympic developments but also about the closure of areas of informal recreation. Apparently, some of the sites being removed from public access will remain out of bounds for a total of thirteen years. This seems bad news in the context of encouraging a new generation of entomologists, even though children from a nearby primary school were involved in the compensatory creation of habitats and will be invited back in future years. For those of us who remember extracurricular childhood encounters with creepy-crawlies in areas that had not been 'tidied up', the value of informal recreation in such places must surely be a fond and abiding memory.

The official promoters of the Olympic development have announced that they are creating wildlife habitats, without mentioning in any straightforward manner that they are also destroying/harming habitats or depriving people of opportunities to study wildlife informally. In 2007, however, a press release from the Olympic Delivery Authority (ODA) indirectly admitted that there was some potential for harm to occur. This stated: "*Although the area has suffered from decades of neglect and industrial use, the wetlands, waterways and woodland areas have been natural habitats for several species of fish, birds, bats and newts and as work on site accelerates the ODA have been taking steps to ensure these species are protected*". This description seems to play down the biodiversity of the open spaces and brownfield habitats that are being destroyed.

Another of the official organisations in the area is the Lee Valley Regional Park Authority (LVRPA), whose website includes an admission that a lack of comprehensive data prevents a thorough assessment of the value of the Lea Valley for invertebrates. Some groups, such as dragonflies and grasshoppers, have been well studied, while others are acknowledged to have received "scant attention". The LVRPA mentions, however, that a number of rare species have been identified and that their presence is likely to be "indicative of rich invertebrate habitats". The LVRPA specifically refers to the Cornmill Stream/Old River Lea, where a number of local or notable species occur. The molluscs recorded there include the Shining Ramshorn Snail *Segmentina nitida*,



a nationally threatened Red Data Book species which is associated with grazing marsh ditches.

The ODA's statement about the protection of species concerned only a range of vertebrates, including amphibians and fish, which were being translocated from a stream (the Pudding Mill River) to other sites, including newly dug ponds and also the main River Lea, where they would presumably be competing with existing populations of the same species. The ODA press release did, however, go on to mention the Toadflax brocade moth *Calophasia lunula* and "species of solitary bee", for which "alternative" habitat sites were being explored. A later statement reported that these invertebrates, together with "endangered ground bugs", spiders and beetles would be provided with habitats in a newly created wildlife corridor around the north perimeter of the Olympic Park site, covering "more than 10,000 square metres".

In view of the total area of planned buildings, paving and other Olympic facilities, the 'new' wildlife corridor can presumably make only a small contribution to the mitigation of habitat loss. There has, however, been another announcement about a much larger "wildlife area" occupying 45 hectares, which will include "four sites for lizards, ponds to allow amphibians to breed and wetlands where grass snakes can lay eggs" (Anon, 2009a). This seems to represent a more substantial contribution towards the mitigation of habitat destruction. Nevertheless, the value of these 'new' wildlife areas must be set against the value of any habitats that previously existed on the same land.

Despite the self-evident cause for concern about the nett loss of habitat, official statements seem to give the impression that the Olympic development represents a wonderful overall gain for wildlife. London Mayor Boris Johnson is quoted as saying: "*The creation of green oasis in the Olympic Park will be a fantastic legacy for Londoners to enjoy for many years to come.*"

Annie Chipchase, an environmental consultant, clearly does not accept all the official hyperbole regarding the 'new' wildlife areas. An anti-Olympic website quotes her as follows: "*The Olympic proposals will destroy all the existing habitat, and thus the associated wildlife. Proposals to provide mitigation in terms of translocating species, and providing alternative habitat, are unlikely to be successful. Only legally-protected species will be the focus of such work. The waterways of the Lower Lea provide a unique place for wildlife and people in a dense urban area*". She has also pointed out that conservation work was taking place for many years before the Olympic bid. Before the successful outcome of the bid was announced in 2005, she was quoted



as describing the Olympic proposals as “*a kick in the teeth for the thousands of volunteers, who, for the last 25 years, have contributed much time and labour to improving habitat.*”

Specific parts of the lower Lea Valley that will be affected both by destruction of habitat and loss of access have been described by naturalists (Chipchase & Woollett, 2006). They have pointed out that construction will destroy all the trees, including native species and mature specimens, in areas such as the East Marsh, which has been a feeding ground for many species of bird. They have also identified an area of grassland and scrub around Eastway Cycle Circuit, which has been an important wildlife habitat but is scheduled for obliteration. There are also concerns about the ecological effects of construction projects which will shade extensive length of watercourses in the valley and about the planned impounding of the River Lea; this will prevent tidal flow, leading to the loss of muddy bank habitats.

It has not been possible for anyone to comment in much detail about the effects of the Olympic development on invertebrates, since few surveys have taken place (as has been admitted by the Lee Valley Regional Park Authority). Survey work was done for an environmental impact assessment prior to the successful outcome of the Olympic bid, but local naturalists have pointed out that this covered only a limited part of the area involved. Chipchase and Woollett (*op. cit.*) have been able to point out that an area known as White Hart Field (scheduled for obliteration under the Olympic scheme) has been home to over 204 species of invertebrate, including six Red Data Book and 17 Nationally Scarce species, as well as the Rose Chafer *Cetonia aurata*, its smaller relative *Trichius zonatus*, and the Brown banded Carder Bee *Bombus humilis*, a UK Biodiversity Action Plan Priority species.

Although a nett habitat loss seems to be occurring, an exclusively positive view is portrayed in the Winter 2008 issue of *Wild London*, the magazine of the London Wildlife Trust (LWT), which has contributed to the ODA's biodiversity plan for the year 2014. Its Chief Executive, Carlo Laurenzi, is quoted as hoping to see the Olympic Park become a “wildlife jewel”. The Spring 2009 issue of *Wild London* describes the LWT's aim of restoring more natural conditions to stretches of the tributaries of the Thames, such as the Rivers Colne, Wandle and Roding. This aim seems to be at odds with activities such as the above-mentioned prevention of tidal flow in the River Lea.

In the ODA's website, Girish Rambaran of the LWT is quoted as follows: “*The London Wildlife Trust is excited about the potential for habitat creation and enhancement around and within the Olympic*



Park. The East Marsh Wildlife Corridor project is a good example of what can be achieved for the Olympic legacy. The variety of habitats to be created here, including shaded wildflower grasslands and log walls with rubble bunds, will present a variety of opportunities for the colonization of invertebrates, birds and reptiles. Engaging local school children to learn about wildlife habitats and species diversity is one of LWT's key aims".

The creation of new habitats has involved a firm of consultants, the Five Rivers Environmental Consultancy. The consultancy's website describes some of the work that is being done in mitigation of habitat loss at the site of a new stadium at Stratford. This includes the provision of a variety of nutrient-poor substrates to support the 'brownfield' flora essential for rare invertebrates, such as *Bombus humilis*. The log-walls, as mentioned by the LWT spokesperson, have been constructed in order to provide additional habitat. The mitigation scheme includes a 2,500 m² brown roof of gravel and moss to encourage invertebrates. This can be compared with 29,000 m² of office space in the Olympic Main Press Centre, about 52,000 m² of studio space at the International Broadcast Centre, a 12,000 m² catering village and a 200 m-long High Street (Anon, 2009b).

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RESEARCH NOTES

House sparrow: research in relation to invertebrates

The decline of the House sparrow *Passer domesticus* in the UK has been so marked as to be obvious to anyone who is old enough to remember it as one of the most common of birds. A PhD study, published four years ago (Vincent, 2005), helped to confirm suspicions that a decline in the abundance of invertebrate prey is likely to be a major factor in the decline of this bird.



Kate Vincent found that starvation of sparrow chicks was a key aspect of population decline in and around the city of Leicester in the East Midlands of England. By analysing faecal contents, she found that this tended to happen if there was a lack of certain kinds of invertebrate prey, gathered by the parent birds, in the chicks' diet. If the chicks' diet contained a large proportion either of ants or supplementary food, which was largely plant-based, they tended not to survive. Suitable invertebrate prey species included aphids, Diptera and spiders, which varied in relative importance between urban, suburban and rural locations. The chicks fared best when spiders formed a large proportion of the diet.

The study also showed that suitable prey items in gardens were more plentiful in gardens if there were high proportions of deciduous shrubs, trees and grass, with relatively little concrete. Increased use of evergreen shrubs and of paving in gardens could therefore be a factor in the decline of both invertebrates and dependent predators.

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LITERATURE REVIEW

Ark sites for White-clawed crayfish: a new pamphlet from Buglife

As mentioned in the last issue of *ICN*, Buglife – The Invertebrate Conservation Trust is enlisting the help of the UK aggregates industry in developing new refugia for the endangered White-clawed crayfish *Austropotamobius pallipes*. Refugia are needed in order to isolate populations of *A. pallipes* from exotic crayfish, which are competitive and which carry a lethally pathogenic fungus-like organism. The project is supported by Natural England through the Aggregates Levy Sustainability Fund.

Buglife has recently published a pamphlet entitled: *Ark sites for White-clawed crayfish – guidance for the aggregates industry*. This provides much useful introductory information about the biology and the conservation status of *A. pallipes*. It then describes the main



attributes required in a crayfish Ark site, giving guidance on the initial selection of sites to be considered. They must be physically isolated from potential colonisation by exotic crayfish and they must be permanently filled with water of suitable quality.

The pamphlet includes further guidance on criteria for assessing the long-term suitability of candidate Ark sites. In view of the perilous status of this species, it is important that any translocated individuals are released only at sites where they are likely to thrive. Also, since the species is legally protected, anyone doing such work or surveying crayfish must be competent and licensed. There is guidance also on the recognition (or, if necessary, the creation) of suitable habitat features, such as niches that provide enough room for an adult crayfish but not enough to enable a predator to reach inside. It is mentioned that aggregate sites often contain suitable features, which have been created inadvertently by the extraction process or naturally established after operations have ceased. These can even include such 'unnatural' features as broken masonry from former buildings.

A very helpful feature of the pamphlet is that it includes a section on the integration of crayfish Ark sites with other site usage, including the conservation of pre-existing wildlife. This is important for managers, who sometimes receive conflicting advice from different interest-groups. Generally, it is a most useful and attractive publication.



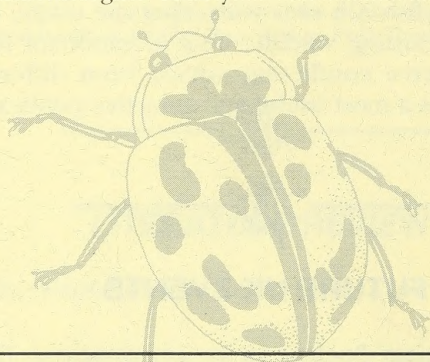
FUTURE UK EVENTS

Amateur Entomologists' Society (www.amentsoc.org). The society is holding many field and indoor meetings in 2009. Conservation is the main purpose of the following event:

- Sat. 22nd – Sun. 23rd August, 2009 (or possibly Fri. 21st – Sat. 22nd): Osterley Park BioBlitz. This will involve a weekend survey of ancient grassland and woodland at Osterley Park, a National Trust property in Middlesex, including examination of the contents of the moth traps left out the previous night. The site, which is within walking distance of Osterley Underground Station (Piccadilly Line), is on the London A-Z map. There are no fixed start-times, but general information can be obtained from Dafydd Lewis: dafydd@mayoconsulting.com

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